

CLAIMS

This listing of claims will replace all prior versions and listings of claims in the Application, with any deleted text shown either between double brackets or as strike-through text, and any added text shown in underlined form:

1. (Previously presented) A current collecting structure comprising:
a current collecting substrate; and
a carbon material formed on said current collecting substrate without the use of binders, wherein said carbon material has a higher density near the current collecting substrate and a lower density in an upper region.
2. (Withdrawn) A current collecting structure comprising:
a current collecting substrate and
a rod-shaped, sponge-shaped, or fiber-shaped carbon material formed on said current collecting substrate.
3. (Withdrawn) A current collecting structure comprising:
a current collecting substrate,
a laminar carbon material formed on said current collecting substrate, and
a rod-shaped, sponge-shaped, or fiber-shaped carbon material formed on said laminar carbon material.
4. (Original) An electrode structure comprising the current collecting substrate of claim 1, and an electrode active material formed on said surface of carbon material.

5. (Original) An electrode structure according to claim 4, wherein said electrode active material has a mean particle diameter of less than 2 microns.

6. (Original) A battery comprising the electrode structure of claim 4.

7. (Withdrawn) A capacitor comprising the electrode structure of claim 4.

8. (Currently Amended) An electrode structure comprising:

a current collecting substrate and

an electrode active material formed on said current collecting substrate without the use of binders, wherein the electrode active material has a density greater than 1.4 grams per cubic centimeter in a lower region near the current collecting substrate and density less than or equal to 1.4 grams per cubic centimeter in an upper region.

9. (Cancelled) An electrode structure comprising:

a current collecting substrate and

a rod-shaped, sponge-shaped, or fiber-shaped electrode active material formed on said current collecting substrate.

10. (Previously presented) An electrode structure according to claim 8, wherein said electrode active material is formed on the surface of said current collecting substrate.

11. (New) The current collecting structure of claim 1, wherein the carbon material is formed as a current collecting layer with a porous structure having internal voids selected from the group consisting of rod shapes, sponge shapes, and fiber-shapes.

12. (New) The current collecting structure of claim 1, wherein the carbon material is selected from the group consisting of hard carbon, soft carbon, and a mixture of hard carbon and soft carbon.

13. (New) The current collecting structure of claim 12, wherein the current collecting structure is a negative electrode current collecting structure.

14. (New) The electrode structure of claim 4, wherein said electrode active material has a mean particle diameter of less than 1 micron.

15. (New) The electrode structure of claim 1, wherein the current collecting structure is selected from the group consisting of ceramic and glass.

16. (New) The electrode structure of claim 8, wherein the electrode active material is selected from the group consisting of LiCoO_2 , LiNiO_2 , and LiMn_2O_4 .

17. (New) The electrode structure of claim 16, wherein the electrode structure is a positive electrode structure.

18. (New) The electrode structure of claim 8, wherein the electrode active material is selected from the group consisting of steam activated carbon and fused KOH activated carbon.

19. (New) The electrode structure of claim 18, wherein the electrode structure is a negative electrode structure.

20. (New) The electrode structure of claim 18, wherein the electrode active material is rod-shaped.

21. (New) An electrode structure comprising:
a current collecting substrate; and

an electrode active material formed on said current collecting substrate without the use of binders, wherein the electrode active material has a density greater than 1.4 grams per cubic centimeter in a lower region near the current collecting substrate and density less than or equal to 1.4 grams per cubic centimeter in an upper region;

wherein the electrode active material is formed on said current collecting substrate as a current collecting layer with a porous structure having internal voids selected from the group consisting of rod shapes, sponge shapes, and fiber-shapes; and

wherein the electrode active material is selected from the group consisting of LiCoO_2 , LiNiO_2 , and LiMn_2O_4 if the electrode structure is a positive electrode structure, or is selected from the group consisting of steam activated carbon and fused KOH activated carbon if the electrode structure is a negative electrode structure.